

# Safety and Postoperative Complications of Single Layer Continuous Extra Mucosal Gut Anastomosis at Allied Hospital Faisalabad

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## ABSTRACT

**Aim:** To determine the complications and safety of single layer continuous extra mucosal gut anastomosis at Allied Hospital Faisalabad.

**Methods:** This descriptive study was conducted in the department of Surgery, Allied Hospital Faisalabad over a period of one year from March 2012 to February 2013. Study comprised of one hundred patients after fulfilling the inclusion and exclusion criteria. The safety and complications of anastomosis technique was analyzed by postoperative complications of morbidity and mortality.

**Results:** The mean age of the patients was 36.8±10.3 years. The mean hospital stay was 6.9±1.6 days. There were 66% male and 34% female patients. There were 9% patients had anastomotic leakage. The rate of wound infection was 22%. The mortality rate was 6%.

**Conclusion:** Single layer continuous extramucosal anastomosis is safe and with less complicated in terms of anastomosis leakage, wound infection and mortality.

**Key words:** Intestinal anastomosis, Extramucosal, Morbidity, Mortality

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## INTRODUCTION

Anastomosis in the gut was unavailable successfully until the 19<sup>th</sup> century. Lambert described his seromuscular technique in 1826, which became the main stay of gastrointestinal surgery in the 2<sup>nd</sup> half of century. Halsted preferred one-layer closure which does not fit in mucosa. Connell used a single layer of interrupted sutures incorporating all layers of the bowel.<sup>1</sup> Different techniques for intestinal anastomosis. Conventional methods, contain sutured (single layer interrupted or continuous, double layer) & stapled Unconventional method contain compression rings (BAR; AKA), tissue stick & laser welding.<sup>2</sup> Currently, the single layer extramucosal anastomosis is popular and is advocated by Norman Matheson of Aberdeen as it probably causes the least tissue necrosis and luminal narrowing.<sup>1</sup> In single layer technique, employing extra mucosal sutures permits for accurate apposition, incorporate the stronger layer (submucosa) of gut, reasons nominal harm to submucosal vascular method and smallest trouble to the lumen<sup>3,4</sup> which is the most important determinant<sup>5</sup>.

The mechanical power of integral intestinal wall is trained with the submucosa & muscularis, even as the serosa and mucosa prove no significant strength<sup>6,7</sup>. Both continuous and interrupted sutures are usually employed in styling intestinal anastomosis. No randomized trial has addressed the

query whether interrupted suture have a important benefit above continuous sutures in single layer anastomosis; though, retrospective services have not revealed any such advantage<sup>3,8</sup>.

Experimentally one layer technique has been confirmed better to two-layer technique by admiration to luminal reduction tissue strangulation and strength of anastomosis on fifth postoperative day.<sup>9,10</sup> Single layer gut anastomosis is secure, undemanding, simple to carry out, easy to train, get smaller time to make and through fewer anastomosis associated complications and mortality. Interrupted single layer serosubmucosal suture is the “gold standard” for intestinal anastomosis and is favoured hand over technique.<sup>2</sup>

The objective of present analysis was to assess the safety and complications of single layer continuous extramucosal gut anastomosis in emergency cases.

## PATIENTS AND METHODS

This descriptive study was carried out in the department of Surgery, Allied Hospital, Faisalabad over a period of one year from February 2012 to January 2013. All adult patients more than 20 years of age and both sexes who underwent single-layer continuous extra mucosal gut anastomosis from DJ junction to rectosigmoid junction were included in the study. Gastric duodenum and rectum, single perforation in sickly gut, patient received after six hours of primary insult and elective surgical cases were excluded. All patients presenting with abdominal trauma (blunt or penetrating) and acute

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abdomen, on clinical and radiological assessment undertaken surgery in the emergency department of Surgery, Allied Hospital Faisalabad. Informed consent for operation as well as about stoma was obtained from the patients or attendants. After history and complete examination were carried out to establish the diagnosis, routine investigations like complete blood count and serum electrolytes. X-ray abdomen was carried out in patients of intestinal obstruction and acute abdomen, Ultrasound examination of abdomen and pelvis, Chest X-ray and ECG were carried out in particular cases. All the patients underwent surgical exploration and additional act was determined on intra-operatively. Senior postgraduate medical resident or consultant carried out all the anastomoses. All the anastomoses were carry out by undertaking single layer continuous extramucosal with or without proximal stoma. In cases containing supposed mass lesions owing to tuberculosis or growth, resected specimen was sent for histopathology.

The collected data analyzed by using SPSS version 11. Frequency and percentages was calculated for qualitative variables like sex and post operative complications like anastomotic leakage wound infection and mortality. Mean±standard deviation was calculated for quantitative variables like age and hospital stay.

**RESULTS**

One hundred (100) patients were included in whom single layer continuous extramucosal gut anastomosis was done. The mean age of the patients was 36.8±10.3 years. There were 32 patients in the age range of 20-30 years (23 male and 9 female), 35 patients in the age range of 31-40 years (24 male and 11 female), 20 patients in the age range of 41-50 years (10 male and 10 female) and 13 patients in the age range of 51-60 years (9 male and 4 female). There were 66% male and 34% female patients. The mean hospital stay was 6.9±1.6 days. In the postoperative complications, there were 9% patients in anastomotic leakage, 22% patients in wound infection, and 6% patients had mortality (Tables 1-3).

Table 1: Distribution of patients by age and sex (n=100)

Age(years)	Male	Female	Total
20-30	23	9	32
31-40	24	11	35
41-50	10	10	20
51-60	9	4	13

Table 2: Distribution of patients by hospital stay (n=100)

Hospital stay (days)	n	%age
4 -6	39	39.0
7 – 9	60	60.0
> 9	1	1.0

Table 3: Distribution of patients by complications (n=100)

Complications	n	%age
Anastomotic leakage	9	9.0
Wound infection	22	22.0
Mortality	6	6.0

**DISCUSSION**

This study was conducted to determine the safety and complication of single layer extra mucosal anastomotic technique in emergent cases. According to Langer<sup>11</sup>, single layer anastomosis is related by means of lesser rate of complications. By comparing both groups of cases by dissimilar anastomotic method, Langer established that double row suture long-lasting the curing procedure, delayed revascularization, and led to formation of intramural abscess and stenotic intraluminal roll building. These problems were not observed in single row anastomosis that is intended to encourage quicker curing.

According to Cvetko<sup>12</sup>, anastomotic leakage mainly take place because of effect of infection and abscess formation which be able to prevented to a great extent by the utilize of sutures that do not go through the mucosa. The mainly significant feature of the study was the anastomotic leakage. As compared to present study, anastomotic leakage was found in 9% patients and as compared to different studies, the leakage rate for single layer interrupted extra mucosal technique differ from 1.2-7.7%<sup>13-16</sup> and findings of present study are next to the higher limit.

Carty<sup>10</sup> found a leakage rate of 2.2% was evaluated that is lesser with the finding of present study but the lesser leakage rate in present study was owing to great number of cases and non emergency trials.

In the study of Leslie<sup>4</sup>, extramucosal method is gold standard for anastomosis relating small and large bowel. The leakage rate was 0.2% (one in 553 patients) that was extremely low with the finding of present study. The lesser leakage rate was due to unusual safety measures and severe devotion to surgical values of operative surgery and completely disinfected environment which is lack in present setup due to deprived finances and serious emergency. In present study, in 36% patients proximal stoma was formed and distal anastomosis was checked by different study, in whom there was no leakage. The wound infection rate in present analysis is 22%, that is greater than 2 to 11% reported in various studies<sup>4,10</sup>.

Intra-abdominal abscess and peritonitis, occurred in 8 % & 8% due to anastomotic dehiscence and unfortunate sterilization. Septicemia happened in 12% because of anastomotic dehiscence. Mean The mean hospital stay in present study was 6.9 days and

overall mortality was 6% that is absolutely higher than 1.5 to 5.8% reported in a study.<sup>10</sup> The reason of mortality was septicemic shock and DIC. The higher rates were because of emergency surgery and poor sterilization in the emergency in present set up.

## CONCLUSION

It is concluded from the results of this study that single layer continuous extramucosal anastomosis is safe and less complicated with acceptable anastomosis-related morbidity and mortality in emergency condition.

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